



# AFRL STW-21 Collaborators Conference

14 February 2000

## **Human Effectiveness Directorate Overview & Collaboration Opportunities**



**Air Force  
Research Laboratory | AFRL**  
*Science and Technology for Tomorrow's Air and Space Force*

James W. Brinkley, SES  
Director



# **Directorate Mission**

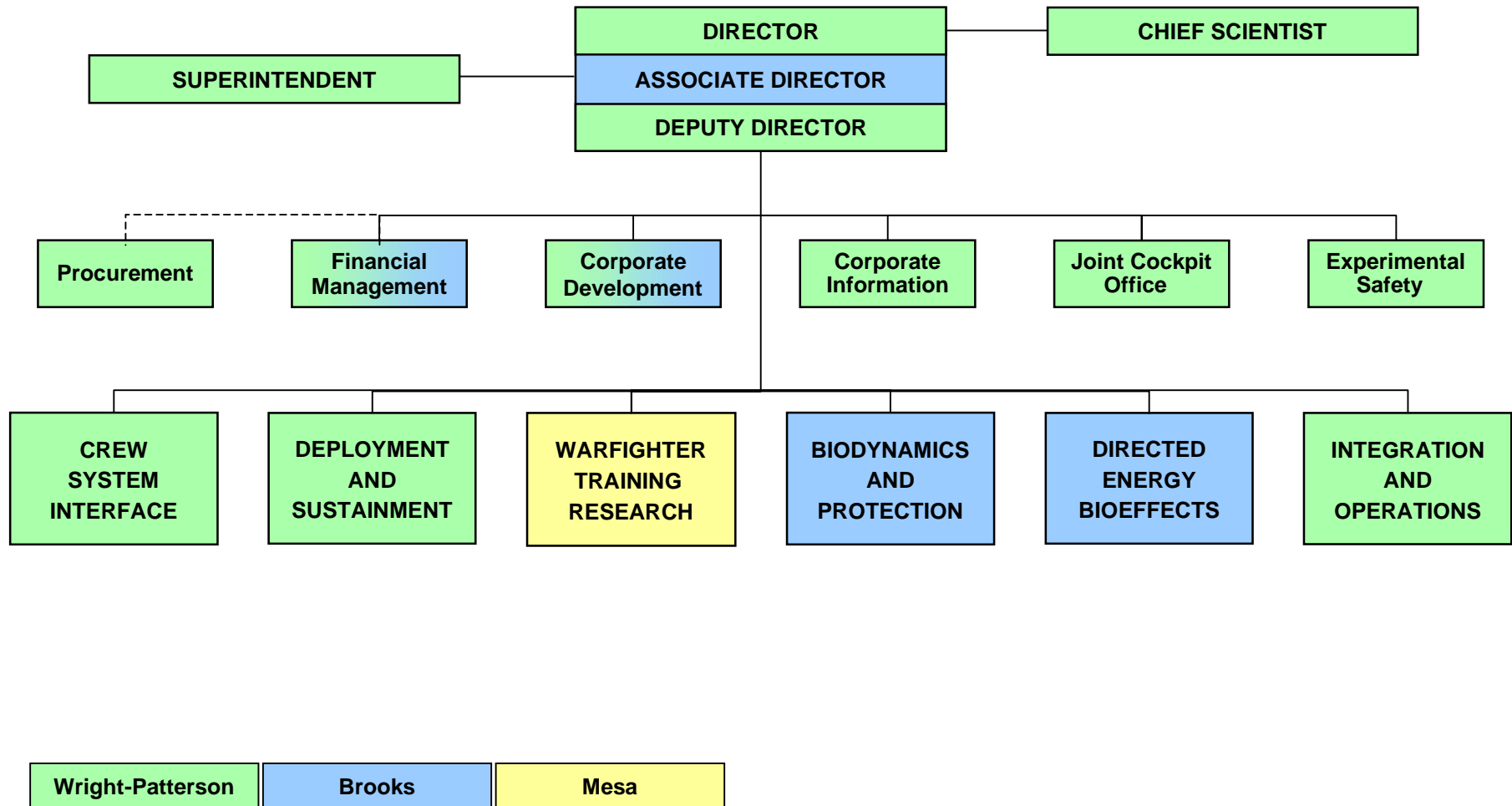
**Develop, integrate, and transition science and technology products for:**

- Training personnel**
- Protecting and Sustaining the crew member**
- Improving Human Interfaces with weapon systems**

**to assure the preeminence of US air and space forces.**

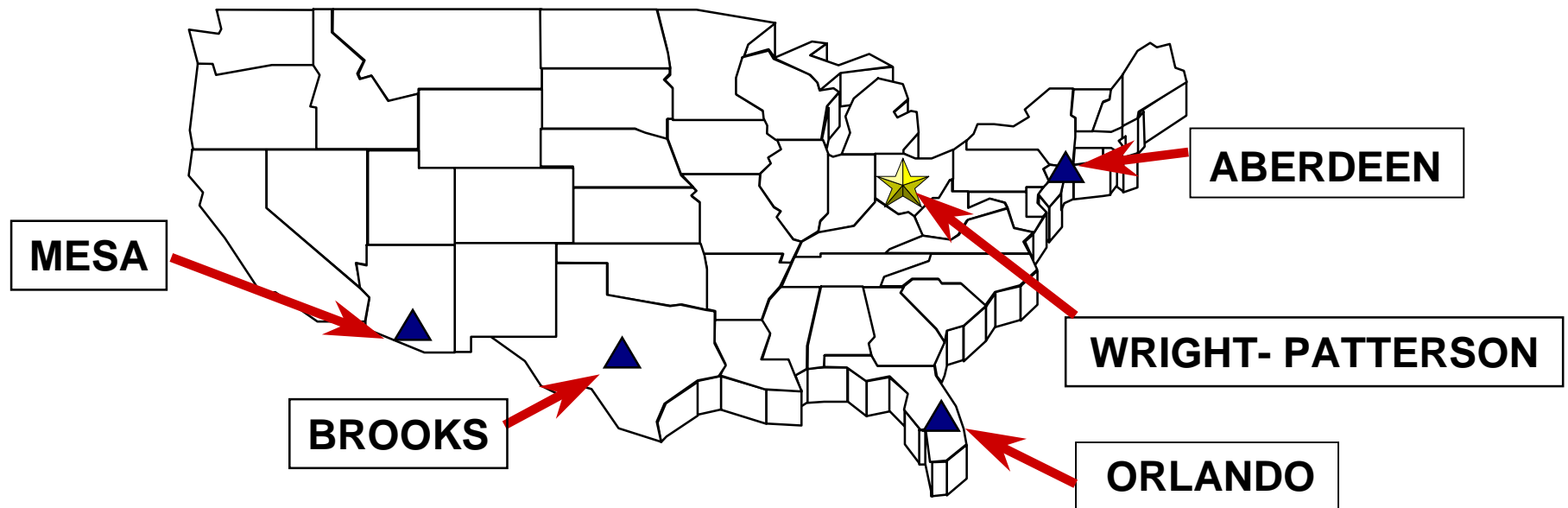


# Human Effectiveness Directorate Organization





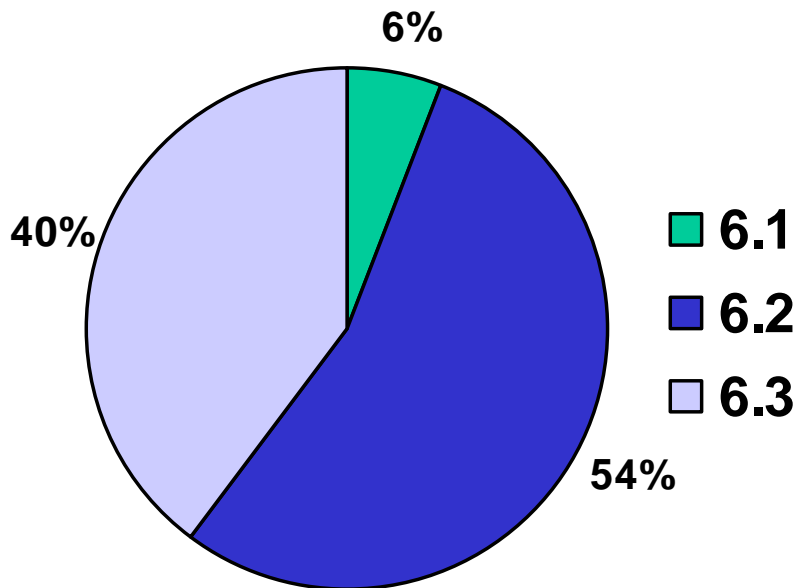
# Human Effectiveness Directorate Research Sites





# Directorate Funding

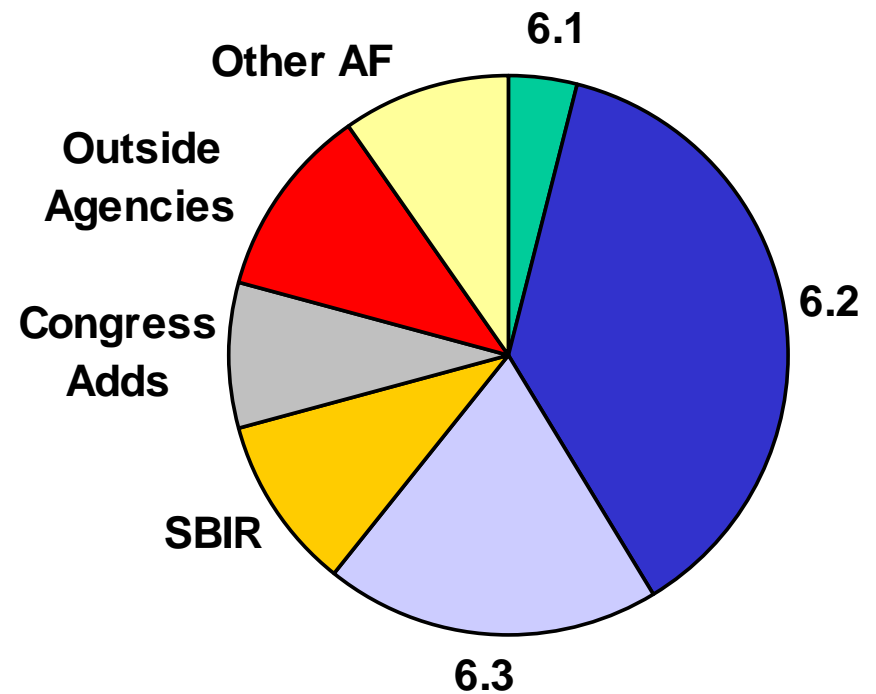
## Core S&T Funding



**FY99 = \$118.4 M**

**FY00 = \$122.5 M**

## FY99 Revenue All Sources



**FY99 = \$172.1 M**







# Major Research Complexes

<b>FACILITY NAME</b>	<b>DIVISION</b>	<b>SITE</b>
<b>Laser Bioeffects Research Facility</b>	<b>HED</b>	<b>Armstrong</b>
<b>RF Bioeffects &amp; Mechanisms Research Facility</b>	<b>HED</b>	<b>Armstrong</b>
<b>Veterinary Sciences Facility</b>	<b>HED</b>	<b>Armstrong</b>
<b>Biodynamics Research Facility</b>	<b>HEP</b>	<b>Wright</b>
<b>Aircrew Protection Research Facility</b>	<b>HEP</b>	<b>Armstrong</b>
<b>Sustained Operations Research Facility</b>	<b>HEP</b>	<b>Armstrong</b>
<b>Human Interface Research Facility</b>	<b>HEC</b>	<b>Wright</b>
<b>Audio/Vibration Research Facility</b>	<b>HEC</b>	<b>Wright</b>
<b>Logistics Research Facility</b>	<b>HES</b>	<b>Wright</b>
<b>Toxicology Research Facility</b>	<b>HES</b>	<b>Wright</b>
<b>Warfighter Training Research Facility</b>	<b>HEA</b>	<b>Mesa</b>



# Core Product Areas and Supporting Core Competencies

## Interrelated Core Product Areas

### User-Centered Criteria for Design, Development, and Acquisition

- **Systems Interface:  
Display & Control**
- **Information Portrayal  
and Decision Aiding  
for Individuals and  
Teams**
- **Protective Systems  
Technologies**
- **Deployment and  
Logistics Systems**

### Warfighter Training Methods and Systems Technology

- **Science of Learning  
and Instruction**
- **Distance Training  
Methods and Tools**
- **Measures of Training  
Effectiveness**

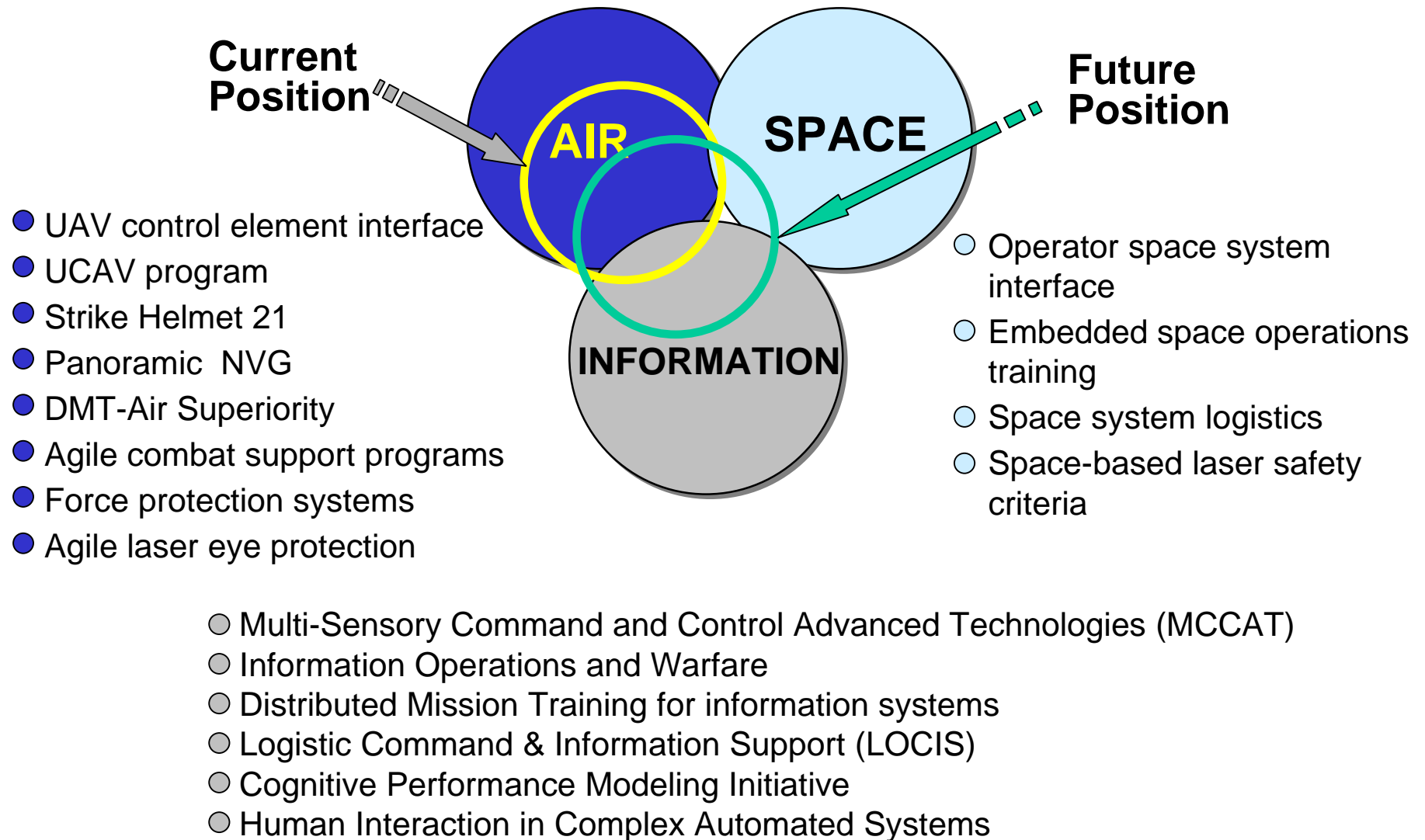
### Assessment of Warfighter and Unit Effectiveness

- **Threat Prediction,  
Biological Effects,  
Countermeasures**
  - Directed Energy
  - CB Weapons
  - Information Ops
- **Human Modeling  
and Simulation**
- **Cognitive Task and  
Mission Analysis**





# Strategic Direction





# Existing Collaborations

- **Collaborations based upon shared interests and mutual as well as individual benefits**
- **Collaboratory at Mesa is vital to the development of Distributed Mission Training technologies**
- **Academic partnerships provide more robust competencies for new technical approaches**
- **Tri-Service collocations enhance ability to meet joint requirements for science and technology**
- **Collaborative agreements to reduce infrastructure costs and to share existing facilities**
- **Cooperative R&D agreements with commercial enterprises**



# Potential Areas of Collaboration

## Enhancement of Mutual Core Competencies

- Science of Learning and Instruction
- Cognitive Science
- Cognitive Systems Engineering
- Cognitive/Intelligence Modeling
- Human-Centered Models of Command and Control
- Scientific Visualization and Information Portrayal
- Detection and Assessment of Biological Agents
- Automated Assessment of Toxicological Hazards
- Non-Ionizing Radiation Biology
- Algorithms for Condition-Based Maintenance



# Potential Areas of Collaboration

## Joint Research Programs

- Competition for research grants
- Aviation cockpit upgrade programs
- Development of human system interfaces for complex automated systems
- Investigation of robotic telepresence in partnership with other governments agencies
- Application of military technologies to commercial product development
- Evaluation of human-in-the-loop systems within synthetic environments



# Potential Areas of Collaboration

## Shared Facilities

- Distributed Mission Training Testbed
- Audio Interface Laboratory
- Synthetic Environment Research Facilities
- Windscreen Optical Test Facility
- Impact and Vibration Test Facilities
- Sustained Acceleration Facilities
- High- Altitude Test Facilities
- Animal Research Facilities



# Summary

- **Human Effectiveness Directorate**
  - Conducting diverse research to prepare, integrate, protect, and sustain the Force
  - World-class personnel and unique facilities
- **Strategy focused on developing technologies**
  - Expeditionary Aerospace Force
  - Transforming Information to Decision and Action
- **Open to varied approaches for collaboration**
  - Strengthen competencies for new technical strategies
  - Conduct joint research programs
  - Expedite transition of technologies
  - Leverage unique facilities